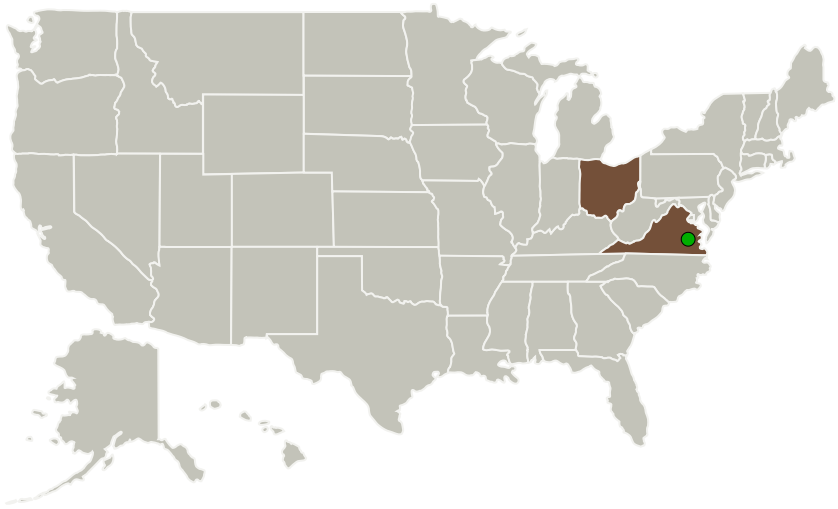
Microblowing Technique for Drag Reduction, Phase I

Completed Technology Project (2015 - 2015)

Project Introduction

NASA seeks to develop technologies for aircraft drag reduction which contribute to improved aerodynamic efficiency in support of national goals for reducing fuel consumption, operating costs, and emissions. The most significant opportunity for efficiency improvement is the reduction of turbulent skin friction drag. NASA research into the microblowing technique (MBT) has been shown to reduce skin friction drag by 50 to 70 percent in subsonic flow and 80 to 90 percent in supersonic flow, which can translate into significant fuel savings. While small-scale wind tunnel testing has been performed to prove the potential benefits of the MBT, additional research is required to develop a complete understanding of boundary layer dynamics, conduct large-scale experiments, and estimate system weight, efficiency, and cost impacts of implementing the MBT on an actual aircraft. Cornerstone Research Group, Inc. (CRG) will address these challenges and mature the MBT with the goal of significantly reducing skin friction drag for aircraft at both high subsonic (0.7 < M < 0.9) and low supersonic speeds (M < 3).

Primary U.S. Work Locations and Key Partners



Microblowing Technique for Drag Reduction, Phase I

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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Cornerstone Research Group, Inc.	Lead Organization	Industry	Miamisburg, Ohio
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Ohio	Virginia

Project Transitions

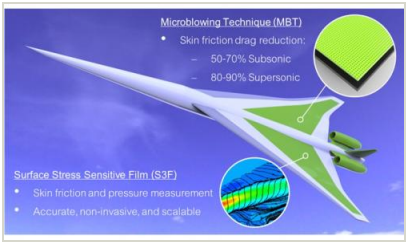
June 2015: Project Start

December 2015: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139214)*

Images



Briefing Chart
Microblowing Technique for Drag Reduction Briefing Chart *(https://techport.nasa.gov/image/126722)*

Final Summary Chart Image
Microblowing Technique for Drag Reduction, Phase I Project Image *(https://techport.nasa.gov/image/132826)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Cornerstone Research Group, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

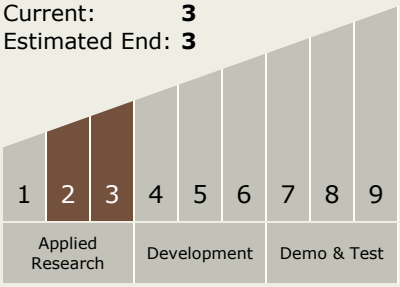
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Bryan M Pelley

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX15 Flight Vehicle Systems
  - TX15.1 Aerosciences
    - TX15.1.1 Aerodynamics

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System